

Real-time Metrology for Li-ion Battery R&D and Manufacturing

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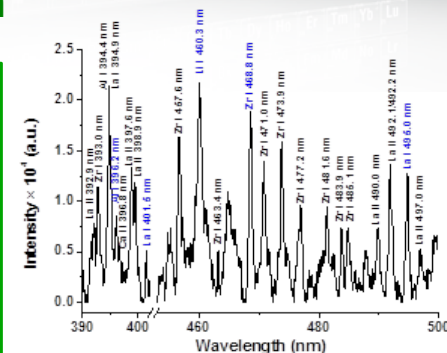
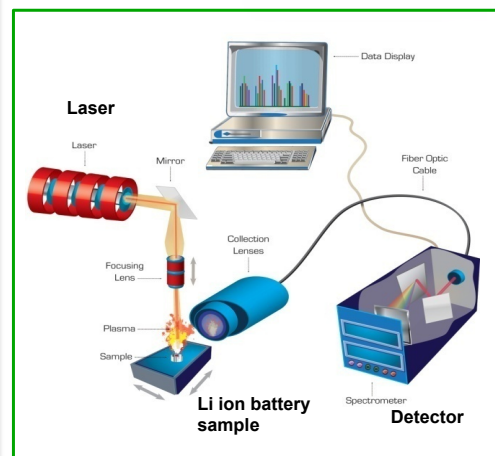
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Objective

- ❑ Develop **LIBS (Laser Induced Breakdown Spectroscopy)** for chemical composition analysis of Li ion battery materials and components.
 - Quantify elemental composition of raw materials used in battery electrodes & electrolytes.
 - Fast chemical composition imaging (2D & 3D) of Li ion battery components and cells.
- ❑ Design beta LIBS instrument that is rapid and cost effective for Li-ion battery R&D and manufacturing QC.

Approach

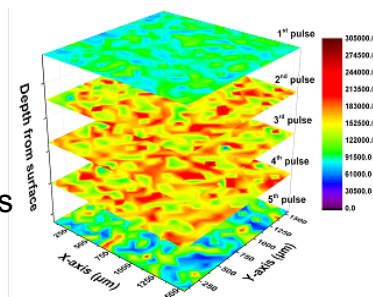


Use micro-plasma light generated from focused laser beam for rapid battery material compositional analysis

Technical Accomplishment

LIBS was demonstrated for:

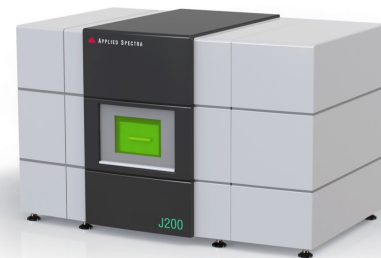
- Raw electrode material composition analysis
- PVDF binder distribution analysis in anodes
- Binder and conductive agent analysis in cathodes
- Elemental ratio mapping for solid state electrolytes



PVDF binder distribution (F) in the anode

Future Works

- Enhancing LIBS instrument detection sensitivity for trace level elements
- Software GUI tailored for Li ion battery material research and inline QC application
- Advanced quantitative analysis model and algorithm for a wide range of Li ion battery materials



J200 LIBS instrument for Li ion battery material analysis

